

PSYCHOLOGICAL INTERPRETATION OF GRAMMATICAL SUBJECT:
EMPIRICAL EVIDENCE OF PERSPECTIVE-TAKING

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A number of attempts have been made to explain the functional status of the grammatical or surface subject of a sentence. These attempts have been from a variety of theoretical perspectives, but essentially what they all try to do is to relate the function of the grammatical subject to some sort of cognitive function. (I should mention here at the outset that in this discussion I am deliberately ignoring considerations of subjecthood based on syntactic or morphological properties or even a multi-factor concept of subject such as that of Keenan (1976). My principal focus here is on the cognitive functions related to subjecthood.) The previous research I have in mind has examined the functional relationship of subjecthood to other cognitive functions such as "topic," in the sense of topic versus comment (Li & Thompson 1976; Hornby 1971, 1972), "theme," in the sense of theme versus rheme (Halliday 1967, 1970), "focus," in the sense of focus versus presupposition (Hornby 1974), "given information," in the sense of given versus new information (Chafe 1974, 1976; Hornby 1972; Haviland & Clark 1974; Clark & Haviland 1977; Clark & Clark 1977), the "figure" of a figure-ground relation (Carroll 1958), or the research has focussed on the cognitive function of subject as an "interest-object" (Carroll 1958), or as the "conceptual focus" (Tannenbaum & Williams 1968, James 1972), the most "prominent" or important element in the sentence (Johnson-Laird 1968a, 1968b; Hornby, Hass & Feldman 1970), the "focus of attention" (Olson & Filby 1972), and so on. (See Sandmann 1954 for a comprehensive review of what people have said about subjects.)

While there is still a widely held view that the status of a noun as surface subject of a sentence is a strictly syntactic status, with only indirect cognitive relevance at best, it seems to me and to many of the researchers mentioned above that it is a priori unlikely that such prominent status in English and in many other languages would be only arbitrary and would not play some important cognitive role as well. However, it should not be surprising to find that, in the course of a language's history, the role of grammatical or surface subject has been confounded

with other roles and that subject might not be associated consistently or necessarily with any single one of the cognitive functions previously listed. For example, although in most instances in English the subject represents "given information," this need not be the case. It is possible to structure an English sentence so that the functions served by given and new and by subject and predicate are signalled separately. Consider, for example, the sentence:

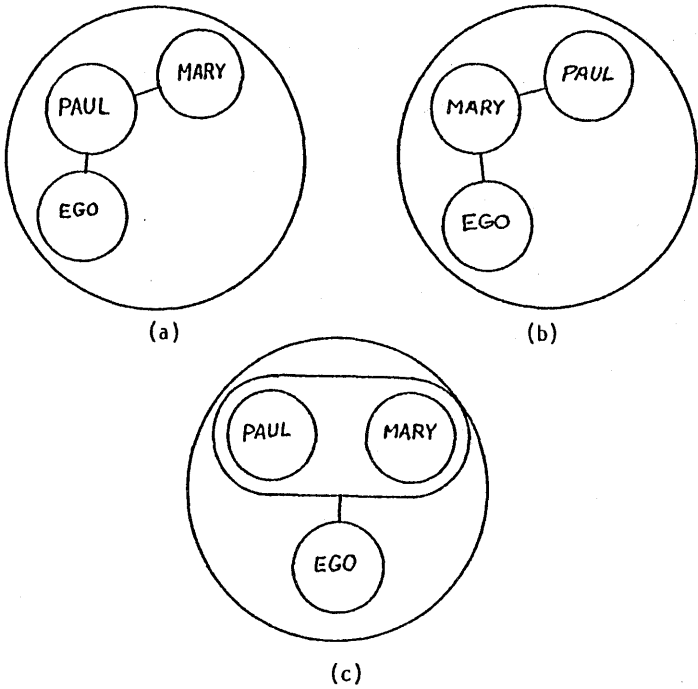
The POLICE investigated the robbery.

In this example, the subject "police" is not given but rather new information as signalled by the contrastive stress. According to Clark & Clark (1977), this example of the possible separation of the cognitive roles served by given versus new information, on the one hand, and by subject versus predicate, on the other hand, shows the difference between the listener-orientation of the given-new contrast, and the speaker-orientation of the subject-predicate contrast.

The "speaker"-oriented nature of the cognitive function served by grammatical subjects appears to be generally agreed upon (Chafe 1976). However, beyond this general agreement, none of the aforementioned available cognitive accounts of subjecthood is entirely satisfactory. Suitbert Ertel (1977), a German psychologist, has offered an interesting alternative viewpoint of the psychological function of grammatical subject, and it is that view that this paper investigates.

Ertel (1977) offers an explanation of the psychological/cognitive role of surface subject in terms of the ego perspective of the speaker. Specifically, in order to explain why speakers choose to produce one from among a set of logically equivalent sentences such as Paul met Mary, Mary met Paul, and Paul and Mary met, Ertel has proposed a theory of sentence construction which involves what he calls the mental "seizing" (sic) of a cognitive unit to be the grammatical subject determined by the ego perspective of the speaker. The speaker seizes as the grammatical subject the cognitive unit closest to his ego. Cf. Figure 1, next page.

According to Ertel, in the phenomenal field of the speaker, i.e. in his current state of consciousness, there are a number of cognitive units, including the speaker himself. Any of these



- (a) Paul met Mary.
- (b) Mary met Paul.
- (c) Paul and Mary met.

Figure 1
Ego Distance of Cognitive Units
in Phenomenal Field of a Speaker
Ertel (1977)

cognitive units may be referred to by nominal phrases, e.g. Paul, Mary, friend, I, telephone call, etc. A speaker is able to think of or attend to a great number of such units simultaneously. However, a speaker cannot and usually does not want to communicate all of what is present in his phenomenal field at one time. Linguistic production is, therefore, dependent upon the speaker's selective communicative intent and is also constrained by the necessity of linear chaining of the verbal units. Ertel assumes that one of the basic mental operations underlying sentence construction is what he calls "nominal seizing." The speaker seizes one and only one of the various nominal units of his cognitive phenomenal field relevant to what is going to be uttered. This "seized" cognitive unit is the primary reference point of the sentential construction and the rest of the sentence--the other nominal units included in it--are set relative to this basic reference point. This basic reference point, the seized nominal unit, becomes the grammatical subject of the constructed sentence. (Ertel 1977:146-147)

Ertel (1977) goes on to argue that nominal seizing in sentence construction, on a more general level of abstraction, is similar to the mental operation governing overt manual grasping, i.e. taking hold of something in one's hand. For example, if I take hold of one object from several objects within my reach, the object in my hand differs from the other objects in one important respect: it is closer to my phenomenal ego. (Ertel 1977:147)

Therefore, if the subject of a sentence represents a cognitive unit that has mentally seized by the speaker because of its closeness to the speaker's ego, one should expect to find empirical evidence of this relative closeness between grammatical subject and speaker's ego. Ertel himself has conducted several empirical studies in German designed to test predictions from the theory.

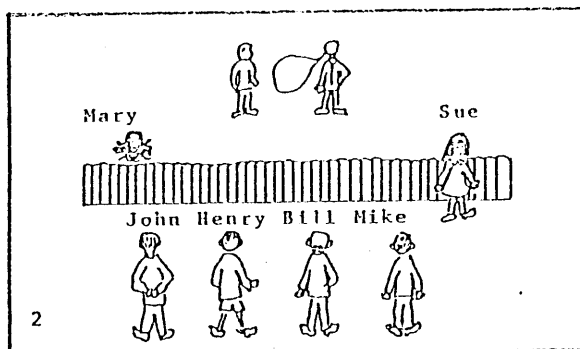
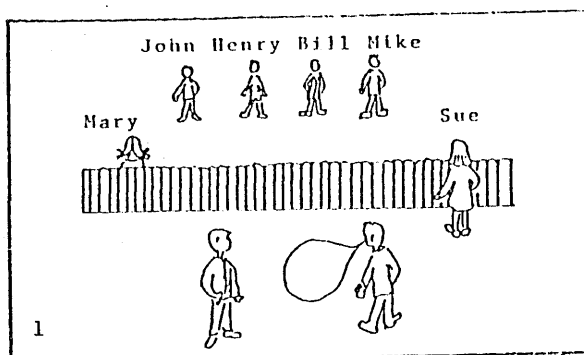
The purpose of this paper is to report the results of a study replicating one of Ertel's research designs for English and to extend Ertel's findings not only to English as a first language, but also to English as a foreign/second language. Such extension adds further support to Ertel's claim that the choice of grammatical subject is not so much specifically a linguistic process as a general cognitive process.

Method

Subjects. Two groups of subjects participated in this study. One was a group of fifty-two (52) adult native speakers of English, all undergraduate students at SIU-C, who were volunteers recruited from two General Studies courses. The other group consisted of sixty-five (65) intermediate/advanced adult students of English as a foreign/second language, all students at our intensive Center for English as a Second Language on campus. These non-native speakers of English were a heterogeneous group from a variety of native language backgrounds.

Procedures. In a sentence interpretation task the subjects viewed two (2) pictures depicting a communicative situation. Cf. Figure 2, next page. Subjects were told that the speaker in the picture utters a sentence to his neighbor and refers to one of the two girls standing at the fence. The subject's task was to indicate to which girl the speaker refers. By pairing each of the two pictures with each of the six different sentences also shown in Figure 2--three with the preposition in front of and three with the preposition behind--the sentences systematically varying the grammatical subject and its position in the sentence, it was possible to test for the perspective from which the reference to the girl at the fence was interpreted. It should be noted that the prepositions in front of and behind may be interpreted from different perspectives; as viewed by the speaker, as viewed by the boys, as viewed by the girls, and even as viewed by the subject looking at the picture. In fact, the reason the two picture orientations shown in Figure 2 were used in the study was to control for any effect due to the subjects' own ego locations.

The theory predicts that the sentence interpretations will be primarily from the perspective of the speaker in the picture; but, because of the close psychological association of the speaker's ego with the grammatical subject, the interpretation may also be from the perspective of the person being referred to by the grammatical subject of the sentence. There should be far fewer interpretations from the perspective of other persons referred to by other nominal units in the sentence, e.g. by the grammatical object in the sentence. Therefore, for sentence (1) in which the pictured speaker refers to himself in the subject position (I am watching...) the interpretation of the prepositions ought to be from the perspective of the speaker. However, for sentence (2), in which the pictured speaker refers to Henry in the subject



- (1) I am watching the girl standing in front of/behind the fence.
- (2) Henry is watching the girl standing in front of/behind the fence.
- (3) It is Henry whom the girl standing in front of/behind the fence is watching.

Figure 2
Sentence Interpretation Task
Pictures and Sentences
Adapted from Ertel (1977)

position, the interpretations of the prepositions may significantly shift from the speaker's perspective to the perspective of Henry, the grammatical subject.

Results

Table 1 shows the mean number of interpretations of the referent for the girl who is standing in front of and behind the fence from the perspective of the pictured speaker for each of the three sentences.

<u>Group</u>	<u>Sentence No.</u>	<u>Grammatical Subject</u>	<u>Mean SPI*</u>
Ertel	(1)	"I"	3.77
German	(2)	"Henry"	1.89
(N=26)	(3)	"girl"	2.69
Carrell	(1)	"I"	2.89
Am. Eng.	(2)	"Henry"	1.29
(N=52)	(3)	"girl"	2.04
Carrell	(1)	"I"	2.68
ESL	(2)	"Henry"	1.50
(N=65)	(3)	"girl"	1.88

*SPI = Speaker Perspective Interpretation
(Picture 1/Picture 2 x in front of/behind = Max. 4)

Table 1
Mean Number
of
Speaker Perspective Interpretations

Table 1 also compares the results of this study with those obtained by Ertel for comparable German sentences with native speakers of German.

In none of the groups of subjects were there any considerable differences between Picture 1 and Picture 2, or between the prepositions in front of and behind; therefore, the results for these 4-way differences are pooled in reporting them in Table 1. Table 1 considers the subjects who participated in the study as independent

units and the number of speaker perspective interpretations (SPI) per sentence as the dependent variable; the potential range was 0-4, with a maximum of 4. In other words, there were four (4) sentences with I as grammatical subject, four with Henry as grammatical subject, and four with girl as grammatical subject; one each with picture 1 and the preposition in front of, one each with picture 1 and the preposition behind, one each with picture 2 and the preposition in front of, and, finally, one each with picture 2 and the preposition behind. The results are presented in terms of the mean number of SPI's per sentence.

The main result for each group is the comparison of the number of SPI's for the I-subject sentences (1) with the number of SPI's for the Henry-subject sentences (2). If the pictured speaker refers to himself in the subject position, the great majority of the subjects in each group interpreted the prepositions from the perspective of the speaker. From the speaker's perspective, in picture 1, the girl in front of the fence is Sue and the girl behind the fence is Mary; in picture 2, vice versa. However, if the pictured speaker refers to Henry in the grammatical subject function, Henry always being on the opposite side of the fence from the pictured speaker, the number of subjects who chose the pictured speaker's perspective is considerably fewer. That is, many chose to interpret the prepositions from the opposite perspective, the perspective of Henry, the grammatical subject. Within each group of subjects, a test of significant differences in the mean number of SPI's for the I-subject sentences and for the Henry-subject sentences is statistically significant ($p < .001$, *t*-test). In other words, for each of the three groups of subjects in this and Ertel's study, there was a significant decrease in SPI's when the speaker and the grammatical subject were not identical; in these cases interpretations could and did shift to come from the perspective of the grammatical subject. This is exactly what Ertel's theory predicted would happen, because of the close cognitive connection between speaker and grammatical subject.

However, we should be aware, as was Ertel, that there is a possible alternative explanation for so many of the Henry-subject sentence interpretations being from the point of view of the grammatical subject Henry. They may, in fact, not be due to the subject role of Henry in the sentence, but to the fact that Henry is the first noun phrase. In other words, one could look at the I-sentence and Henry-sentence results and argue that the interpretations are from the perspective of the first noun phrase in the

sentence and that the interpretations have nothing to do with the role of grammatical subject. It was in order to control for this possible effect of position that sentence (3) was used in the task. In sentence (3), as compared to sentence (2), Henry and the girl have exchanged their grammatical functions but not their relative positions in the sentence. If the prepositions are merely interpreted from the perspective of the person referred to in the first noun phrase position, there ought to be no difference in the mean number of SPI's between sentences (2) and (3). On the other hand, if the interpretations of the prepositions tend to be related to grammatical function, there ought to be differences between sentences (2) and (3), as well as between (1) and (3).

What were the results for sentence (3)? For each group of subjects, the differences in the mean number of SPI's for the Henry-subject (2) sentences and the girl-subject (3) sentences were statistically significant ($p < .05$, t-test). (The differences between sentences (2) and (3) in the ESL group were not very great, and were only marginally significant for this group.) Similarly, for each group of subjects, the differences between the mean number of SPI's for the I-subject sentences (1) and the girl-subject sentences (3) were also highly statistically significant ($p < .001$, t-test). The fact that the means for sentence (3) with girl-subject were significantly higher than for sentence (2) with Henry-subject shows that there were considerably more interpretations of sentence (3) from the speaker perspective than in sentence (2). However, the fact that the means for sentence (3) with girl-subject were significantly lower than for sentence (1) with I-subject shows that there were considerably fewer interpretations in sentence (3) from the speaker perspective than in sentence (1). All of these results can be explained by referring to Figure 3. Cf. Figure 3, next page.

Sentence (1), in which speaker perspective, grammatical subject perspective, and position as first noun phrase all coincide, clearly produces the highest number of SPI's. Sentence (2), in which the speaker and grammatical subject are not one and the same, but in which the grammatical subject is the first noun phrase, may cause shift in interpretation away from the speaker's perspective and toward the perspective of the grammatical subject, the first noun phrase. Note that this is not a shift toward the perspective of a grammatical object, for if it were, we'd have found it in sentence (1). In sentence (3), in which the grammatical subject is not the first but the second noun phrase, and

Sentence No.	Grammatical Subject	SPI	Other I	Sentence
(1)	"I"	$\left\{ \begin{array}{l} \text{Speaker} \\ =\text{Gram. Subj.} \\ =\text{1st NP} \\ =\text{"I"} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Gram. Obj.} \\ =\text{2nd NP} \\ =\text{"girl"} \end{array} \right.$	"I am watching the girl standing in front of/behind the fence."
(2)	"Henry"	Speaker	$\left\{ \begin{array}{l} \text{Gram. Subj.} \\ =\text{1st NP} \\ =\text{"Henry"} \end{array} \right.$ $\left\{ \begin{array}{l} \text{Gram. Obj.} \\ =\text{2nd NP} \\ =\text{"girl"} \end{array} \right.$	"Henry is watching the girl standing in front of/behind the fence."
(3)	"girl"	Speaker	$\left\{ \begin{array}{l} \text{Gram. Obj.} \\ =\text{1st NP} \\ =\text{"Henry"} \end{array} \right.$ $\left\{ \begin{array}{l} \text{Gram. Subj.} \\ =\text{2nd NP} \\ =\text{"girl"} \end{array} \right.$	"It is Henry whom the girl standing in front of/behind the fence is watching."

Figure 3
Coincidence of Perspectives,
Grammatical Function, and Sentence Position

in which the first noun phrase is, in fact, the grammatical object, we see a slight shift back toward interpretation from the speaker's perspective, but not as strong a tendency to interpret from the speaker's perspective as in sentence (1). This suggests, of course, that the position of the grammatical subject in a sentence has an additional effect, but that the role of grammatical subject is still a strong determiner of the perspective taken in sentence interpretation.

Conclusions

In summary, the results of both Ertel's and my findings lend support to the assumption that the cognitive unit underlying the grammatical subject noun phrase of a sentence is closer to the speaker's ego than that underlying an object noun phrase. Because of this close cognitive association of the speaker's ego to the grammatical subject, in sentence production a speaker may give up his egocentric perspective and shift to the perspective of the person to whom he is referring in subject position, and in sentence interpretation, the interpretation may shift from the perspective of the speaker to the perspective of the person referred to in subject position. This tendency is not found with respect to persons to whom the speaker refers as grammatical objects in a sentence.

In even more general terms, these results lend additional support to the view mentioned at the outset, that, at least in Western European languages like German and English, the role of grammatical subject is not merely an arbitrary, superficial, syntactic role, but one with important cognitive significance as well.

REFERENCES

- Carroll, John B. 1958. Process and content in psycholinguistics. In R. Glaser (ed.), Current trends in the description and analysis of behavior. Pittsburgh: University of Pittsburgh Press.
- Chafe, Wallace L. 1974. Language and consciousness. Lg. 50.111-133.

- Chafe, Wallace L. 1976. Givenness, contrastiveness, definiteness, subjects, topics, and point of view. In Charles N. Li (ed.), *Subject and topic*. New York: Academic Press.
- Clark, Herbert H. and Eve V. Clark. 1977. *Psychology and language: an introduction to psycholinguistics*. New York: Harcourt, Brace, Jovanovich.
- Clark, Herbert H. and Susan E. Haviland. 1977. Comprehension and the given-new contract. In R. O. Freedle (ed.), *Discourse production and comprehension*. Norwood, N. J.: Ablex Publishing.
- Ertel, Suitbert. 1977. Where do the subjects of sentences come from? In Sheldon Rosenberg (ed.), *Sentence production: developments in research and theory*. Hillsdale, N. J.: Erlbaum.
- Givón, Talmy. 1976. Topic, pronoun, and grammatical agreement. In Charles N. Li (ed.), *Subject and topic*. New York: Academic Press.
- Halliday, Michael A. K. 1967. Notes on transitivity and theme in English, Part II. *Journal of Linguistics* 3.199-244.
- . 1970. Language structure and language function. In John Lyons (ed.), *New horizons in linguistics*. Harmondsworth: Penguin Books.
- Haviland, Susan E. and Herbert H. Clark. 1974. What's new? Acquiring new information as a process in comprehension. *JVLVB* 13.512-521.
- Hornby, Peter A. 1971. Surface structure and the topic-comment distinction: a developmental study. *Child Development* 42.175-188.
- . 1972. The psychological subject and predicate. *Cognitive Psychology* 3.632-642.
- . 1974. Surface structure and presupposition. *JVLVB* 13.530-538.

- Hornby, Peter A., Wilbur A. Hass, and Carol F. Feldman. 1970. A developmental analysis of the 'psychological' subject and predicate of the sentence. *Language and Speech* 13.182-193.
- James, Carlton T. 1972. Theme and imagery in the recall of active and passive sentences. *JVLVB* 11.205-211.
- Johnson-Laird, P. N. 1968a. The interpretation of the passive voice. *Quarterly Journal of Experimental Psychology* 20.69-73.
- _____. 1968b. The choice of the passive voice in a communicative task. *British Journal of Psychology* 59.7-15.
- Keenan, Edward L. 1976. Toward a universal definition of "subject." In Charles N. Li (ed.), *Subject and topic*. New York: Academic Press.
- Kuno, Susumu. 1976. Subject, theme, and the speaker's empathy--a reexamination of relativization phenomena. In Charles N. Li (ed.), *Subject and topic*. New York: Academic Press.
- Li, Charles N. and Sandra A. Thompson. 1976. Subject and topic: a new typology of language. In Charles N. Li (ed.), *Subject and topic*. New York: Academic Press.
- Olson, David R. and Nikola Filby. 1972. On the comprehension of active and passive sentences. *Cognitive Psychology* 3.361-381.
- Sandmann, Manfred. 1954. *Subject and predicate: A contribution to the theory of syntax*. Edinburgh: Edinburgh University Press.
- Tannenbaum, Percy H. and Frederick Williams. 1968. Generation of active and passive sentences as a function of subject or object focus. *JVLVB* 7.246-252.